

REMARKS

The Office Action dated January 4, 2008 has been received and carefully noted. The above amendments and the following remarks are being submitted as a full and complete response thereto.

Claims 1-10 have been rejected. New claim 11 has been added. Thus, claims 1-11 are pending in this application. Support for the amendments may be found in the specification and claims as originally filed. Applicants submit that no new matter is added. Applicants respectfully request reconsideration and withdrawal of all rejections.

Rejection Under 35 U.S.C. §112

Claims 1-10 are rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. The Examiner contends that the Applicants have failed to provide support for the claimed subject matter. In particular, the Examiner states that there is not support for amending the claims to be in Jepson format. The Applicants respectfully traverse this rejection.

The Applicants respectfully submit that support for the Jepson format of the claims is found at least in the Specification at page 2, lines 1-3, where it is stated that the azeotropic or near azeotropic compositions are used as CFC 11 substitutes in the foaming field. Also see the Examples in Table 14 on page 33 and page 34, lines 9-12, where the quantities of the fluorinated foaming agents and water are stated to be comparable to those used in the reference formulation of CFC-11. The examples of Table 14 show that the compositions of the present invention can yield foams with almost the same density, i.e. of about 30 kg/m^3 , as that of the composition of CFC 11.

Further, the Applicants note that in the field of chemistry, the term "substitution" means that one element is substituted with another as a result of a chemical reaction. See the attached excerpt from "The Condensed Chemical Dictionary, Eighth Ed." at page 832. Thus, "substitution" in chemistry means that in a reaction an element is entirely substituted by another. The Applicants submit that one skilled in the field of chemistry would understand that in the present case, "substitution" of CFC-11 with azeotropic or near azeotropic compositions of claim 1 means that in polyurethane foaming formulations containing CFC 11, a molar amount of azeotropic or near azeotropic compositions of the present invention equal to that of CFC 11 is used. Further, lack of examples does not mean that the invention is not adequately described since support for the Jepson format, as noted above, is given in the Specification.

The Applicants direct the Examiner's attention to example α comp. where the moles of CFC 11 + H₂O are 0.33, example γ where the moles of HFPE1/HFC 365 mfc (60/40) + H₂O are 0.32, and example \bar{o} where the moles of HFPE1/HFC 356 ffa (20/80) + H₂O are 0.33. In fact, in example α comp., foam density is 30 Kg/m³ and foam appearance is good. In example γ , foam density is 30 Kg/m³ and foam appearance is good. In example \bar{o} , foam density is of 29.8 Kg/m³ and foam appearance is good.

The Declaration of Alberto Nicoletti dated May 15, 2007, submitted with the Applicants' response of May 24, 2007, shows that the same results for foam density and foam appearance are obtained when foaming formulations of the azeotropic or near azeotropic compositions of the invention are used, wherein the molar amount of

composition IV (Test A) is the same as that of CFC 11 and the % by weight of each of the other components is the same as in the formulation containing the comparative blowing agent.

The Examiner states that the Declaration of May 15, 2007 is insufficient. Please note that a clerical error was made in the Declaration, since the composition comprising CFC 11 was the same as example α comp. of Table 14, not example γ , as indicated in the Declaration. It appears that the Examiner has also recognized the clerical error made in mentioning example γ instead of example α comp in the Declaration (See page 4, lines 1-3 of the Office Action). The Applicants repeated the experiments of the Declaration of May 15, 2007 in the herein enclosed Declaration of Alberto Nicoletti. The results obtained are the same as those obtained in the preceding Declaration. Therefore the Nicoletti Declarations confirm that azeotropic or near azeotropic compositions of the present invention can be used as substitutes of CFC 11.

In addition, the Applicants submit that the enclosed Declaration confirms that composition V) can also be used as substitute of CFC 11. Further, since both compositions are near azeotropic (since, as explained above, by varying the % by weight of HFPE1 the boiling point remains almost constant, by using a molar amount of compositions IV) or V) in a polyurethane foam expansion equal to that of CFC 11 in example α comp.), a foam density of about 30 Kg/m³, and the same foam appearance would be expected.

Therefore the Declarations of Nicoletti together with the data given in Table 5 and 6 of the Specification indicate that support exists for the full scope of the claims.

The Applicants further remark that a density of about 30 Kg/m³ can be obtained with all the polyurethane formulations encompassed by the claims. Foam expansion depends on the mole amount of the blowing agent in the gas phase.

The Applicants note that Table 5 on page 23 of the Specification shows that for composition IV) consisting of the HCF₂OCF₂OCF₂H/HFC 365 mfc binary mixture, the boiling point is almost constant throughout the whole composition range, since the compositions are near azeotropic. In fact, Table 5 shows that the average boiling point is 33.91°C, the highest value being 36.89°C and the lowest value being 33.1°C. Therefore by using a molar amount of composition IV (independently of the actual % by weight of each of the two components), equal to that of CFC 11 in example α comp. in the polyurethane foam expansion, a foam density of about 30 Kg/m³ and the same foam appearance would be expected.

The same can be repeated for composition V), consisting of HCF₂OCF₂OCF₂H/HFC 356 ffa binary mixture, in view of the boiling points at different % by weight of HFPE1 in the mixture shown in Table 6 on page 24 of the Specification. With regard to the Jepson format issue, the Applicant has also carried out experiments with composition V) of claim 1. This experiment is reported as Test B, right column, in the enclosed Nicoletti Declaration. Test B has been carried out by using a molar amount of HFPE1/HFC 356 ffa (20/80) equal to that of CFC 11 of example α comp., the quantities as % by weight of the other components of the foaming formulations being the same as in example α comp.

Considering the meaning of the term "substitution" in chemistry, one skilled in the art would know that the substituent blowing agent, i.e. compositions IV) or V) of present

claim 1, must be used in a same molar amount of CFC 11 in the polyurethane foaming formulations containing CFC 11.

The Applicants respectfully submit that to the two issues that the Examiner states must be addressed on p. 3 of the Office Action – the first issue being the substitution of CFC-11 for the claimed blowing agents, and the second issue being whether such a substitution has been described for the full scope of the claims – have been addressed. For at least the above reasons, Applicants respectfully request withdrawal of the §112 rejection of claims 1-10.

Rejection Under 35 U.S.C. §102

Claims 1-4, 9 and 10 are rejected under 35 U.S.C. §102(b) as being anticipated by Klug et al. ('882 or '016 or '931, hereinafter "Klug"). Applicants respectfully traverse this rejection.

The Applicants respectfully submit that Klug does not disclose the method of the present invention. The Examiner has not cited any passage of Klug disclosing the compositions of present claim 1. In fact, Klug does not mention that the azeotropic or near azeotropic compositions can be substituted for CFC 11 in foaming polyurethanes. Therefore, claim 10 directed to polyurethane foams is also novel over Klug.

Further, Klug does not disclose HFC 365 mfc or HFC 356 ffa. The combinations of HFPE1 with HFC 365 and, respectively, with HFC 356 ffa are not disclosed in Klug. Therefore, new claim 11 is also novel over Klug.

The Examiner contends that the formulas of the hydrofluoroether and hydrofluorocarbon disclosed in Klug are not so extensive that one could not have

envisaged compositions IV) and V), and that the rejection is considered to be tenable in view of MPEP §2131.02 (See p. 6 of the Office Action). The Applicants remark that in this case, it is not the formulas themselves that must be shown, but instead the combinations obtained from combining each of the hydrofluoroether compounds with each of the hydrofluorocarbon compounds from the corresponding formulas reported in Klug. Moreover, the 122 combinations of hydrofluoroether/hydrofluorocarbon noted in cols. 9-11 of Klug fail to disclose compositions IV) and V) of present claim 1.

With regard to MPEP §2131.02, the Applicants point out that anticipation can only be found if the classes of substituents are sufficiently limited or well delineated. As a limited number of compounds, the number of 20 is exemplified. See the comments under *In re Petering* 133 USPQ 275 (CCPA 1962). In addition, only if one of ordinary skill in the art is able to "at once envisage" the specific compound within the generic formula, is the compound anticipated. Moreover, in the comments under *In re Schaumann* 197, USPQ 5 (CCPA 1978) the MPEP states that claims to a specific compound were found to be anticipated because prior art compounds were closely related to each other in structure and the properties possessed by the compounds of the prior art were the same as those disclosed for the claimed compound.

The Applicants respectfully submit that claims are novel over Klug in view of MPEP §2131.02 since the 122 combinations of a hydrofluoroether with a hydrofluorocarbon reported in Klug at cols. 9-11, as stated above, fail to disclose compositions IV) and V) of claim 1. In addition, one skilled in the art would not be able to envisage the compositions IV) and V) in the cited reference because the hydrofluorocarbons HFC 365 mfc and HFC 356 ffa are not disclosed in Klug. See

col. 5, lines 40-63 of Klug. Further, the compositions of the present invention do not have the same properties of the compositions disclosed in Klug. See the Declaration of Giampiero Basile of November 10, 2000. Accordingly, Applicants respectfully submit that Klug does not anticipate independent claims 1 and 9, and claims 3, 4 and 10, which depend therefrom.

For at least the above reasons, Applicants respectfully request reconsideration and withdrawal of the rejection of claims 1-4, 9 and 10 under 35 U.S.C. §102(b) over Klug.

Rejections Under 35 U.S.C. §103

Claims 1-4, 9 and 10 are rejected under 35 U.S.C. §103(a) as being unpatentable over Klug. Applicants respectfully traverse this rejection.

The Applicants submit that the gist of the present invention is to find azeotropic or near azeotropic compositions consisting of an hydrofluoroether and an hydrofluorocarbon that could substitute for CFC 11 in foaming polyurethanes (See the Specification at pages 4-5). In addition, the substitutes should have an ODP equal to zero and low GWP and VOC values.

Example 2 on page 32 describes how the composition of example α comp. of Table 14 containing CFC 11 is prepared and expanded. Table 14 shows that the polyurethane foam obtained by using CFC 11 as a blowing agent has a density of 30 Kg/m³. The Applicants have shown in the Declaration of Giampiero Basile dated November 10, 2000 that many of the compositions disclosed by Klug '931 in cols. 9-11 cannot be used as blowing agent substitutes of CFC 11, since they are not able to

expand in the same conditions as CFC 11 and provide a foam with the same characteristics. Therefore, the Applicants submit that the Examiner's obviousness objection is untenable as it is contrary to the Basile Declaration.

The Applicants respectfully submit that Klug does not even provide a pallid hint in addressing the compositions IV) and V). Thus, Applicants respectfully submit that claims 1-4, 9 and 10 are not obvious over Klug.

For at least the above reasons, Applicants respectfully request reconsideration and withdrawal of the rejection of claims 1-4, 9 and 10 under 35 U.S.C. §103(a) over Klug.

Claims 5-7 are rejected under 35 U.S.C. §103(a) as being unpatentable over Klug in view of Barthelemy et al. ('320, hereinafter "Barthelemy"). Applicants respectfully traverse this rejection.

Secondary reference Barthelemy fails to cure the defects of primary reference Klug as described above. The proposed combination of Barthelemy with Klug does not teach or suggest compositions IV) and V) of present claim 1. The Applicants submit that nowhere do the cited references teach or suggest that compositions IV) and V) could be substituted for CFC 11 in a polyurethane foaming agent.

In Barthelemy, density values higher than 30, i.e. around 33.5 (33.4 - 33.7) are reported (See col. 7, Table III). Therefore, it would not be obvious for one skilled in the art to produce a foam having the claimed density. In addition, the Applicants submit there is no conventional density value known in the art of polyurethane foams. See, for instance Table 2 in cols. 5-6 and 7-8 of U.S. Patent No. 5,169,873, herein enclosed. Under the column of said Table 2 headed "Bulk density (Kg/m³)", it is stated that the

bulk density value of the polyurethane foams obtained by using various blowing agents ranges from 35 (example 6) to 48 (comparative example 3).

The Examiner has stated that the cited references provide a suggestion to those skilled in the art to use azeotropic or near azeotropic compositions in polyurethane foams as blowing agents as replacements for virtually any conventional blowing agents. As such, those skilled in the art would expect to find all the compositions disclosed by Klug suitable for substituting CFC 11 in polyurethane foaming. The Basile Declaration demonstrates that it is not so.

The gist of the present invention, as stated above, is not only finding optimal blowing agent formulations to obtain the substitution of environmentally damaging blowing agents with less damaging ones, but to provide azeotropic or near azeotropic compositions that could substitute for CFC 11 in foaming polyurethanes to give the same foam density, and the same foam appearance, as shown by Nicoletti Declarations. Surprisingly and unexpectedly, Applicants have found compositions IV) and V), not suggested by Klug, that have such properties.

The Applicants submit that it is not possible to determine whether some of the hundreds of compositions that could be obtained from combining each of the hydrofluoroether compounds with each of the hydrofluorocarbon compounds from the corresponding formulas reported in Klug, could be found suitable for the same use as claimed, without performing undue experimentation. Therefore, the Examiner's position that the present invention represents an optimization and would have been obtained by those skilled in the art through routine experimentation is untenable. Moreover, the Basile Declaration shows that this is not the case.

The results obtained by the Applicant are unexpected. The Applicants submit that the Examiner has read the cited references with the knowledge of the present invention. Accordingly, the Examiner's assertions are based on an *ex post facto* analysis, which is not appropriate.

In response to the Examiner's argument that skilled workers make certain experiments and adaptations within their skill if they do not immediately obtain desired results, the Applicants assert that Klug provides no teaching or suggestion for which azeotropic or near azeotropic compositions could substitute for CFC 11 as blowing agents in polyurethane foams or on azeotropic or near azeotropic compositions containing as hydrofluorocarbon, respectively, HFC 365 mfc nor HFC 356 ffa. Therefore, Klug does not provide one skilled in the art any guidance to arrive at the claimed compositions.

In addition, according to the Examiner, the failure of the results of Basile would cause those skilled in the art to adapt the experiments to bring the failure into success. The Applicants submit that the Examiner has failed to recognize that it is not known whether the experiments carried out by Basile will work by changing the conditions, as the Examiner states. The Examiner has not indicated under which conditions the failure can be brought into success. The Applicants also note that the claimed compositions are completely different from the compositions of Basile. Those skilled in the art would have to test the numerous compositions disclosed at cols. 8-9 of Klug without any guidance to conclude that none of them could substitute CFC 11.

In conclusion, the Applicants submit that claim 1 is not obvious since neither Klug alone, nor Klug and Barthelemy together, suggest the azeotropic or near azeotropic

compositions that can be used in polyurethane foams to substitute CFC 11 to obtain the same foam appearance and foam density, as shown in the Nicoletti Declarations. The results obtained in the present invention, contrary to the Examiner's statement, are unexpected in view of the Basile Declaration. Thus, Applicants respectfully submit that claims 5-7 are not obvious over the proposed combination of Klug and Barthelemy.

For at least the above reasons, Applicants respectfully request reconsideration and withdrawal of the rejection of claims 5-7 under 35 U.S.C. §103(a) over Klug in view of Barthelemy.

CONCLUSION

Applicants respectfully submit that this application is in condition for allowance and such action is earnestly solicited. If the Examiner believes that anything further is desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact Applicants' undersigned representative at the telephone number listed below to schedule a personal or telephone interview to discuss any remaining issues.

In the event that this paper is not being timely filed, the Applicants respectfully petition for an appropriate extension of time. Any fees for such an extension, together with any additional fees that may be due with respect to this paper, may be charged to Counsel's Deposit Account Number 01-2300, referencing Docket Number 108910-00123.

Respectfully submitted,



Sushupta T. Sudarshan
Registration Number 60,021

Customer Number 004372
ARENT FOX LLP
1050 Connecticut Avenue, NW
Suite 400
Washington, DC 20036-5339
Telephone: 202-857-6000
Fax: 202-638-4810

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Enclosures: Declaration of Dr. Alberto Nicoletti Pursuant to 37 C.F.R. § 1.132
The Condensed Chemical Dictionary (2 pages)
U.S. Patent No. 5,169,873